

VERSION WITH MARKINGS TO SHOW CHANGES MADE

Claims 17, 21, 26, 29 and 35 have been amended as follows:

17. (Amended) A method of manufacturing a semiconductor device comprising:

preparing a semiconductor wafer having an upper surface including chip-forming regions, a lower surface opposing the upper surface, sides extending between the upper and lower surfaces, and a plurality of outer connection terminals formed on the upper surface;

making trenches in parts of the semiconductor wafer which lie between the chip-forming regions, each trench successively extending [at least] to half a thickness of the semiconductor wafer from the upper surface of the semiconductor wafer;

forming a first seal film on the upper surface of the semiconductor wafer in a manner such that the trenches are filled and such that a top surface of each of the outer connection terminals is exposed;

forming a second seal film on the lower surface of the semiconductor wafer; and

cutting the first seal film along the trenches by removing parts of the first seal film having a smaller width than the trenches such that the semiconductor wafer is separated into individual semiconductor devices, each of which has the first seal film provided on an upper surface thereof and [at least] on an upper part of a periphery thereof while leaving a lower part

of the periphery thereof exposed, and each of which has the second seal film provided on the lower surface thereof.

21. (Amended) [The] A method [according to claim 18, wherein the trenches are formed so as to cut the semiconductor wafer completely in a thickness direction and] of manufacturing a semiconductor device comprising:

5 preparing a semiconductor wafer having an upper surface including chip-forming regions, a lower surface opposing the upper surface, sides extending between the upper and lower surfaces, and a plurality of outer connection terminals formed on the upper surface;

10 forming a rear seal film on the lower surface of the semiconductor wafer;

adhering a dicing tape to a lower surface of the second seal film;

15 making trenches in parts of the semiconductor wafer which lie between the chip-forming regions, each trench successively extending from the upper surface of the semiconductor wafer to half a thickness of the dicing tape so as to form concavities in an upper portion of the dicing tape;

20 forming a front seal film on the upper surface of the semiconductor wafer in a manner such that the trenches are filled and such that a top surface of each of the outer connection terminals is exposed; and

cutting the front seal film along the trenches by removing
parts of the front seal film having a smaller width than the
trenches such that the semiconductor wafer is separated into
individual semiconductor devices, each of which has the front
5 seal film provided on an upper surface thereof and on an entire
surface of a periphery thereof, and each of which has the rear
seal film provided on the lower surface thereof.

26. (Amended) A method of manufacturing a semiconductor device comprising:

preparing a semiconductor wafer having an upper surface including chip forming regions, a lower surface opposing the
5 upper surface, sides extending between the upper and lower surfaces, and a plurality of connection pads formed on the upper surface;

forming on the upper surface of the semiconductor wafer an insulating film having openings such that the upper surface of
10 the semiconductor wafer is covered and the connection pads are exposed via the openings;

forming on the insulating film wirings connected to the connection pads;

forming pillar-shaped electrodes on the wirings;

15 adhering a dicing tape to the lower surface of the
semiconductor wafer;

making trenches in parts of the semiconductor wafer which lie between the chip-forming regions, each trench successively

extending [at least half a thickness of the semiconductor wafer]
20 from the upper surface of the semiconductor wafer to half a
thickness of the dicing tape so as to form concavities in an
upper portion of the dicing tape;

forming a seal film on the upper surface of the
semiconductor wafer in a manner such that the trenches are filled
25 and such that a top surface of each of the pillar-shaped
electrodes is exposed; and

cutting the seal film along the trenches by removing parts
of the seal film having a smaller width than the trenches such
that the semiconductor wafer is separated into individual
30 semiconductor devices, each of which has the seal film provided
on an upper surface thereof and [at least] on [an upper part of]
a periphery thereof [while leaving a lower part of the periphery
thereof exposed], wherein a portion of the seal film provided on
the periphery projects from a lower surface of the semiconductor
35 devices.

29. (Amended) A method of manufacturing a semiconductor
device comprising:

preparing a semiconductor wafer having an upper surface
including chip forming regions, a lower surface opposing the
40 upper surface, a thickness between the upper and lower surfaces,
and a plurality of pillar-shaped electrodes formed on the upper
surface;

adhering a dicing tape to the lower surface of the semiconductor wafer;

making trenches [in] by cutting parts of the semiconductor wafer which lie between the chip-forming regions, each trench
5 successively extending to half a thickness of the dicing tape [in part] through the thickness of the semiconductor wafer from the upper surface of the semiconductor wafer;

forming a seal film on the upper surface of the semiconductor wafer so as to fill in the trenches and cover the
10 pillar-shaped electrodes;

polishing an upper surface of the seal film until a top surface of each of the pillar-shaped electrodes is exposed; [and]

cutting the seal film along the trenches by removing parts of the seal film having a smaller width than the trenches;

15 adhering a support tape to the upper surface of the seal film after cutting the seal film along the trenches;

peeling off the dicing tape from the lower surface of the semiconductor wafer after adhering the support tape to the upper surface of the seal film, and

20 polishing the lower surface of the semiconductor wafer after peeling off the dicing tape.

35. (Amended) A method of manufacturing a semiconductor device comprising:

preparing a semiconductor wafer having an upper surface including chip forming regions, a lower surface opposing the

upper surface, a thickness between the upper and lower surfaces, and a plurality of pillar-shaped electrodes formed on the upper surface;

forming a rear seal film on the lower surface of the semiconductor wafer;

making trenches by cutting in parts of the semiconductor wafer which lie between the chip-forming regions, each trench successively extending to half a thickness of the rear seal film [in part] through the a thickness of the semiconductor wafer from the upper surface of the semiconductor wafer;

forming a front seal film on the upper surface of the semiconductor wafer so as to cover the upper surface of the semiconductor wafer while leaving a top surface of each of the pillar-shaped electrodes exposed, and so as to fill in the trenches and thereby entirely enclose each of the chip-forming regions within the front seal film and the rear seal film; and

cutting the front seal film along the trenches by removing parts of the front seal film having a smaller width than the trenches such that the semiconductor wafer is separated into individual devices, each of which has the front seal film provided on the upper surface thereof and on a periphery thereof, and each of which has the rear seal film provided on the lower surface thereof.